



In the Claims:

Please cancel claim 1-51 without prejudice, and please add new claim 52-69.

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52. (New) A tool set configuration for fabricating interconnect metallization structures on a workpiece, comprising:

a film deposition tool set having a first vapor deposition station for depositing a barrier layer on a workpiece;

a pattern processing tool set including a coating station for depositing a resist on the workpiece and an exposure apparatus configured to expose selected portions of the resist to a radiation for forming a patterned mask; and

a wet processing tool set including a plating station for plating metal into recesses formed in the resist to form interconnect metallization structures over portions of the barrier layer and a first processing station for electrically isolating the metallization structures.

53. (New) The tool set configuration of claim 52 wherein the film deposition tool set further comprises a second vapor deposition station for depositing a seed layer onto the barrier layer.

54. (New) The tool set configuration of claim 52 wherein the wet tool set further comprises a rinse/dry station for removing resist from the workpiece.

55. (New) The tool set configuration of claim 52 wherein:

the wet tool set further comprises an etching station;

the plating station of the wet tool set comprises an electroplating station; and

the first processing station of the wet tool set comprises an oxidizing station.

56. (New) The tool set configuration of claim 52 wherein:

the film deposition tool set further comprises a second vapor deposition station for depositing a seed layer onto the barrier layer; and

the wet tool set further comprises an etching station, the first processing station of the wet tool set comprises a rinse/dry station for removing resist from the workpiece, the plating station of the wet tool set comprises an electroplating station, and the wet tool set further comprises an oxidizing station.

57. (New) A method of fabricating interconnect metallization structures on a workpiece, comprising:

applying a conductive barrier layer to the workpiece in a film deposition tool set; forming a patterned resist layer on the workpiece, the patterned resist layer being a mask having openings in a pattern of interconnect metallization structures; plating a metal into the openings of the resist layer in a wet processing tool set to form the interconnect metallization structures; and altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other in the wet processing tool set.

58. (New) The method of claim 57 wherein plating a metal into the openings comprises electroplating copper onto exposed portions of the barrier layer in the openings.

59. (New) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein (a) the openings in the resist layer expose portions of the seed layer and (b) plating a metal into the openings comprises electroplating copper onto the exposed portions of the seed layer.

60. (New) The method of claim 57 further comprising electroplating a protective layer onto surfaces of the interconnect metallization structures.

61. (New) The method of claim 57 wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each

other comprises oxidizing portions of the barrier layer between the interconnect structures.

62. (New) The method of claim 57 wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises removing portions of the barrier layer between the interconnect structures.

63. (New) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises oxidizing portions of the barrier layer between the interconnect structures.

64. (New) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises removing portions of the barrier layer between the interconnect structures.

65. A method of fabricating metal interconnect structures on a workpiece, comprising:

applying a barrier layer to the workpiece in a first deposition station of a film deposition tool set;

applying a copper seed layer to the barrier layer in a second deposition station of the film tool set;

forming a patterned mask of a resist on the copper seed layer, the patterned mask having a plurality of openings defining locations for forming raised metal interconnect structures on the seed layer;

plating copper onto the copper seed layer in the openings of the patterned mask in a first wet processing station of a wet tool set to form copper interconnect structures;

removing the patterned mask in second wet processing station of the wet tool set; and

removing portions of the seed layer between the copper interconnect structures in a third wet processing station of the wet tool set.

66. (New) The method of claim 65 wherein plating copper onto the copper seed layer comprises electroplating copper.

67. (New) The method of claim 65 wherein:

plating copper onto the copper seed layer comprises electroplating copper; and

removing portions of the seed layer between the copper interconnect structures comprises etching the copper seed layer.

68. (New) The method of claim 65 wherein:

plating copper onto the copper seed layer comprises electroplating copper; and

the method further comprises exposing the workpiece to an oxygen-containing environment to form a first oxide on the copper interconnect structures and a second oxide between the copper interconnect structures, removing the first oxide over the copper interconnect structures, and plating a protective layer onto surfaces of the copper interconnect structures.

69. (New) The method of claim 68 wherein removing portions of the seed layer between the copper interconnect structures comprises removing the second oxide from between the copper interconnect structures.